

ornament quite so well as might be desired, the agreement in this character between my specimen and the original figures and description is such as to make the specific determination also a matter of certainty.

*On the Anatomy of Pyrosoma.* By M. L. JOLIET.

*Growth of the Colony.*—All the observers who have paid attention to *Pyrosoma* have remarked that the closed extremity of the colony is occupied by four ascidiozooids. According to Savigny and Lesueur these are the four primitive individuals developed in the egg itself. As regards *Pyrosoma elegans*, in which, as stated by Keferstein and Ehlers, the endostyle is on the side of the common orifice, I cannot say how this may be; but in *Pyrosoma giganteum* things are different. Panceri has already remarked that the terminal ascidiozooids are destitute of those muscular cords which terminate at the periphery of the common cloacal aperture, and which are possessed by the primitive ascidiozooids. Moreover, in *P. giganteum*, as in *P. atlanticum*, the endostyle, and consequently the germinative point, are turned in the direction of the closed extremity. It follows that an animal placed at a given moment in the immediate vicinity of that extremity is necessarily separated therefrom some time afterwards by the three or four buds which it has directly produced, and, still later, not only by these but by their derivatives.

When we examine the closed extremities of several quite adult colonies, measuring several centimetres in length, we see that the four individuals forming the terminal whorl are in one specimen perfectly adult and beginning to breed, in another young and still furnished with an elæoblast, elsewhere, again, in the condition of simple buds, forming part of the stolon, and not yet detached from the parent. In a word, the terminal whorl of one colony does not resemble that of another colony of the same age, which would not be the case if this whorl were the primitive whorl. From these facts we see that if we desire to find the four primitive individuals, it is not at the closed extremity that we must seek for them, but at the open extremity. They are, in fact, incessantly pushed away from the former by the whole of their progeny.

*Nervous System.*—On the posterior median line there exists a nerve which traverses it throughout nearly its whole extent. It does not originate directly from the ganglion, but from a train of cells which seem to prolong the latter backwards, runs above the base of the languets, and appears to act upon a bundle of muscular fibres, which, passing behind the œsophagus, traverses the cloaca skirting the subintestinal peritoneal lamina.

In the four primitive ascidiozooids the two thick lateral posterior nerves terminate at the two muscular cords which start from the two sides of the œsophagus and run to the common cloaca. In the ordinary individuals there only exists one of these muscular cords; it is median, and morphologically represents the two cords of the primitive individuals; for it receives both the nerves.

*Colonial Muscular System.*—Besides the muscular cords just mentioned, there exist in the common transparent substance muscular bands which are by no means so well defined, and which unite the individuals to one another in the longitudinal direction. Panceri has described their course with considerable exactitude, but without knowing their origin. These muscular bundles originate in the transparent substance itself, in which we see them diverging at certain points; and they seem to be formed at the expense of the actual cells of this substance modified in a peculiar manner. The normal constituent cells of the common transparent substance are stellate.

*On the Elæoblast.*—Salensky has endeavoured to show that the elæoblast of the *Salpæ* may be the altered representative of the tail of the *Appendiculariæ* and the tadpole-larvæ of Ascidians. As regards *Pyrosoma*, this hypothesis is inadmissible. The elæoblast, in fact, acquires in *Pyrosoma* the form of a ring surrounding the generative extremity of the endostyle. It is therefore no longer a simple organ as in the *Salpæ*. By its form and relations it cannot represent the tail of the *Appendiculariæ*.

Its function appears rather to be physiological. It enlarges so long as the bud remains attached to the parent, and diminishes from the moment when separation is effected, until that in which the young ascidiod, being brought into communication with the outer world, can live on its own account; it then disappears altogether. I do not think it plays any part, even a subsidiary one, in gemmation. In fact, it has completely disappeared at the period when gemmation has only just commenced. In all probability it acts as a reserve for the young animal at the time when its nutrition is still null or insufficient.

*On the Alternation of Generations.*—If we desire to bring together as much as possible what takes place in the *Salpæ* and what occurs in *Pyrosoma*, we must take as equivalent terms, on the one hand, the agamic *Salpa*, and, on the other, the Cyathozoid. We have then, in the two cases, two asexual individuals producing by gemmation a whole series of individuals which differ from them in form, are alike, and sexual. The whole difference then lies in the fact that, while the sexual *Salpæ* cannot bud, the sexual *Pyrosomata* are capable of producing by gemmation other individuals, but similar to themselves.—*Comptes Rendus*, April 25, 1881, p. 1013.

*Investigation of certain Points in the Anatomy of Sternaspis scutata.*—Second Note\*. By M. MAX. RIETSCH.

The vascular system of *Sternaspis* is very complex and interesting; it may be summed up by saying that it includes a dorsal vessel and a ventral system.

The dorsal vessel follows the stomach, upon which it rests, in all its contours; it is much narrower behind than in front of the bran-

\* See 'Annals,' May 1881, p. 426.